

IOWA GYRATORY MIX DESIGN (SuperPave) FOR LOCAL AGENCIES

IMPLEMENTATION BULLETIN #3
December 2000

Preliminary evaluation of the data indicates that **over 90% of the current local agency Marshall mixes analyzed meet the current Iowa Gyratory Design requirements** for pavements less than 300,000 ESALS with the elimination of the restricted zone (for gradation) and using gyratory levels of 7, 68, and 104. There did not seem to be any regional impacts encountered because of local aggregate differences. A report of the study will be published in 2001.

Gyratory levels refer to the N_{initial} (7) - number of gyrations of the Gyratory Compaction Device that are required to indicate compatibility (tenderness) of the mix, N_{design} (68) – the predicted density after 3-5 years of service life in the wheel tracks (like 50 or 75 blow Marshall), and N_{max} (104) – an overload condition or safety factor to compensate for an increase in traffic load.

ESALs (Equivalent Single Axle Load) for the local projects were calculated, for the purposes of this study, from the ADTs (Average Daily Traffic) and assuming 10% trucks. ESALs are the unit of measure for the pavement load generated by each vehicle axle. The 300,000 ESAL design level is equivalent to about 50 ESALs per day (or 125 trucks per day).

The committee continues to receive gyratory test data from 1999 and 2000 Marshall projects from cities and counties. Please refer to SuperPave Bulletin #2 for the data requirements for this mixture evaluation. Previous Bulletins are available on the Local Systems website at www.dot.state.ia.us/local_systems/publications/publications.htm under the heading "Iowa Gyratory Mix Design (SuperPave) Bulletins". This evaluation of current mixtures is the key component of the Implementation Plan and is essential for a successful implementation of gyratory technology for low volume routes. A broad representation of mixtures statewide will ensure implementation of the technology with minimal impact to the local agencies. If your agency did not have a recent asphalt construction project, mix designs back to 1993 can be evaluated. The criteria that is being developed is based on a statewide cross-section of data. If you have any questions about this process please contact John Hinrichsen at the Central Materials Office at (515) 239-1601.

We urge Agency and industry representatives to take advantage of the free training sessions will be held statewide in the winter 2000-2001 training season. This training will benefit both engineers and technicians responsible for pavement design, mix design and construction practices. The dates and locations of these training sessions are shown below:

February 1 - Ames
February 13 - Atlantic
February 21 - Sioux City

February 26 - Fairfield
March 6 - Mason City

To sign up for any of these sessions please contact your District Materials Training Officer or Chris Anderson at the Central Materials Office at (515) 239-1819. For more information on SuperPave training contact Mike Heitzman at the Central Materials Office at (515) 239-1003.

It is the goal of the Implementation Team to have a Special Provision for local agencies to utilize Gyratory technology by April of 2001. We realize that this will not meet the deadlines for projects being let in Spring of 2001, but it is the hope of the committee that local agencies will be willing to utilize this technology in pilot projects through Mutual Benefit Change Orders with the contractors. If a local agency does not want to wait for the Special Provision and would like to design a Gyratory project for the 2001 construction season the current specifications should be sufficient. The preliminary evaluations indicated that over 90% of the Marshall mixes meet the current gyratory specifications. To ensure that a mix is comparable in properties to the Marshall mixes currently in use make sure to be familiar with the design guidelines, especially concerning the specified aggregate size.

This is the third in a series of bulletins to be issued by the Implementation Team. It is the intent of the Implementation Plan to successfully apply Gyratory Mix Design Technology for all future asphalt paving in Iowa. This Implementation Plan will allow local agencies to continue to utilize their existing aggregates while applying Gyratory Mix Design criteria. Minor adjustments to local mixtures may be necessary; however, it is the intent of the implementation evaluation to NOT have a significant impact on the current local agency asphalt programs. The activities of the Implementation Action Plan continue to move forward. If you desire more information about the Implementation Plan please contact Mike Heitzman at the Central Materials Office at (515) 239-1003.